



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

U.S. Patent

Application of: K. SHIMIZU

Serial Number : 09/900,961

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For : CELLULOSE ESTER FILM, CELLULOSE ESTER DOPE,
PROTECTIVE FILM OF POLARIZING PLATE AND POLARIZING PLATE

Group Art Unit: 1772

Examiner : Sow-Fun Fon

DECLARATION UNDER 37 C.F.R. 1.132

Hon. Commissioner of Patents

and Trademarks

Washington, D.C. 20231

Sir:

I, KUNIO SHIMIZU, hereby declare and say as follows:

That I am a post graduate from Hokkaido University
having been awarded a Masters Degree in Technology in March
1980.

That since April 1986, I have been employed by Konica
Corporation, the owner of the above-identified application.
During my employment, I have been engaged in the research
and the study of polarizing plate materials in the Research
and Development Laboratory of my company.

That I am a sole inventor of the present application.

That I am familiar with the subject matter of the
present invention.

What follows is an accurate summary of experiments conducted according to my detailed instructions and under my personal supervision, and the results obtained therefrom.

Comparative tests

1. Iwashita et al. discloses the use of a cellulose triacetate film in the polarizing plate of the EXAMPLE 8, however, Iwashita et al. does not disclose a cellulose ester film containing any additive such as fine particles and a plasticizer, much less a cellulose ester containing a specific polymer as claimed. Mercurio et al. teaches a cellulose ester film with the polymer of less than 5,000 weight average molecular weight comprising methyl acrylate monomer, but does not disclose a cellulose ester film with fine particles having an average particle diameter of 0.01 to 1.0 μm nor application of the cellulose ester film to the polarizing plate or the liquid crystal display as claimed. Neither Iwashita et al. nor Mercurio et al. discloses the cellulose ester film containing the fine particles having an average particle diameter of 0.01 to 1.0 μm as recited in claims 15 and 16. Accordingly, a combination of Iwashita et al. and Mercurio et al. cannot attain the claimed invention.

2. In order to further show the unexpected results of the invention, additional comparative tests were carried out employing a combination of Iwashita et al. and Mercurio et al.

3. The following dope composition was processed in the same manner as in Examples of the present Specification.

(Dope composition)

Cellulose acetate butyrate resin in EXAMPLE 24 of Mercurio et al.	100 weight parts
Methyl methacrylate oligomer with an Mw of 750 in EXAMPLE 24 of Mercurio et al.	15 weight parts
Rutile TiO ₂ powder in EXAMPLE 23 of Mercurio et al. (having an average particle diameter of 10 microns)	0.1 weight parts
2-(2'-hydroxy-3',5'-di-t-butylphenyl) benzotriazole	2 weight parts
Methylene chloride	475 weight parts
Ethanol	50 weight parts

In the above composition, rutile TiO₂ powder was adjusted to give an average particle diameter of 10 microns, which was closest to the average particle diameter as recited in instant claims 15 and 16 among the Mercurio et al. disclosure (see column 9, line 44 of Mercurio et al.). Further, the cellulose ester film as obtained above contained rutile TiO₂ powder of 0.08 weight %. Thus, a cellulose film sample 101 (comparative) was prepared. Subsequently, polarizing plate sample 101 (comparative) was prepared in the same manner as in Examples of the Specification, except that the cellulose film sample 101 was used.

A cellulose ester film sample 102 (Inventive) was prepared in the same manner as in cellulose film sample 101 obtained above, except that rutile TiO₂ powder having an average particle diameter of 1.0 micron was used instead of rutile TiO₂ powder having an average particle diameter of 10 microns. Subsequently, polarizing plate sample 102 (inventive) was prepared in the same manner as in polarizing plate sample 101 above, except that the cellulose film sample 102 was used.

Herein, the polarizing plate sample 101 (comparative) is closest to the invention, among those which are derived from a combination of Iwashita et al. and Mercurio et al., since it is different only in size of TiO_2 powder from the polarizing plate sample 102 (inventive).

4. The resulting samples were evaluated by haze of the film samples. Haze of the film samples 101 and 102 was measured, employing a haze turbidimeter NDH-2000 produced by Nippon Denshoku Industries Co., Ltd. Herein, a film sample with a haze of not less than 0.5% cannot be applied to a polarizing plate or a liquid crystal display, since it results in lowering of image contrast. The results are shown in Table 5.

Table 5

Polarizing plate sample	Film sample used	Average particle diameter of rutile TiO_2 powder used	Haze of film sample
101 (Comparative)	101 (Comparative)	10 μm	1.0%
102 (Inventive)	102 (Inventive)	1.0 μm	0.2%

As is apparent from Table 5 above, the inventive film sample 102 exhibited reduced haze as compared with comparative film sample 101. Particularly, the comparative film sample 101 has a haze of 1.0%, which cannot be applied to a polarizing plate or a liquid crystal display. Thus, the invention exhibits greatly improved result as compared with the closest prior art. The result is unexpected to one of ordinary skill in the art, and it would not have been obvious to one of ordinary skill in the art to attain the invention over Iwashita et al. in view of Mercurio et al. Accordingly, we believe that instant claims 15 to 27 are in a situation of allowability.

I further declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001, of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Dated: January 21, 2004

Kunio Shimizu
KUNIO SHIMIZU